

Heindel and Noyes

P.O. Box 64709 Burlington, Vermont 05406-4709

~~AUG 03 1999~~

AUG 08 1999

• Consulting Hydrogeologists
• Engineers
• Environmental Scientists

802-658-0820

Fax 802-860-1014

July 30, 1999

Mr. Chuck Schwer
Department of Environmental Conservation
Sites Management Section
103 South Main Street, West Office
Waterbury, VT 05671-0404

Re: Woolworth Investigation
Commons Shopping Center
St. Albans, VT

Dear Chuck:

This letter summarizes the results of a subsurface investigation performed by Heindel & Noyes (H&N) on June 16 - 17, 1999 at the site of the former Woolworth's garage at the Highgate Commons Mall in St. Albans (refer to Appendix 1, page 1). Accordingly, the letter documents field activities, presents laboratory analytical results, and gives conclusions and recommendations as to the future action at the site.

SITE DESCRIPTION AND BACKGROUND

The former Woolworth garage is located at the northern end of the Highgate Commons Mall in St. Albans, Vermont (Appendix 1, page 2-3). The garage is made up of two bays, with an approximate area of 1060 ft². The floor and surrounding walls are constructed of concrete. Refer to the site plan (Appendix 1, page 4) to view the layout of the garage. Presently, the garage is used by a local contractor for light truck maintenance and as a storage facility. Historically, the garage operated as Grant Automotive until it closed in 1987. Records show that a 12,000-gallon underground storage tank (fuel oil) was removed from the parking lot outside the garage in 1987. However, three hydraulic lifts, each with a buried sump of hydraulic oil, were not removed.

Mr. Chuck Schwer
July 30, 1999
Page 2

Recently, Mr. David Kleger, a representative of the current owners of the shopping center, contracted H&N to investigate any environmental hazards associated with the former garage. As one component of this investigation, six soil borings (SB-1 – SB-6) were installed adjacent to the hydraulic lifts inside the garage and soil was sampled for volatile organic compounds (VOCs). Minimal evidence of leakage was detected in soil samples collected from these borings. The letter in Appendix 3 presents the details of this April 1999 investigation of contaminant conditions below the concrete slab.

A second component of the investigation was to explore whether there was any contamination from the former 12,000-gallon UST. The approximate location is shown in the site map. According to our records, the tank removal was performed by New England Marine Contractors in 1987 and was partially overseen by the SMS. From a letter in the file,¹ a slight sheen and some PID readings over 200 parts per million (ppm) were noted. As part of our site characterization performed twelve years later in September 1998, an H&N field technician hand-installed a shallow boring near the former location of the tank. PID measurements of the soil from this boring were as high as 300 ppm. With this information, H&N arranged and oversaw the installation of an additional six soil borings and two monitoring wells in the vicinity of the former tank. Prior to the work, a Site Expressway notification form was completed and sent to the Sites Management Section (SMS). This work, performed between June 16 –17, 1999, is described in the following report.

SOIL BORING INSTALLATION

On April 16, 1998, Specialty Drilling & Investigation (SDI) installed a total of six soil borings in the parking lot near the former tank. The borings were advanced with a hydraulically operated drive point to bore through the soil to depths ranging from 6 to 11 feet below ground surface (bgs). The locations of the borings, labeled DP-1 through DP-6, can be seen on the attached site plan. Soil samples were collected continuously in 4-foot long acetate liners that fit inside the sampling tube. Observations were made as to the soil type, texture, moisture content, visual and olfactory signs of contamination, and were then screened for volatile components using a photo-ionization detector (PID). Refer to the soil boring logs (Appendix 1, pages 6-12) for the full description of each sample that was collected.

The soil encountered underneath the pavement was coarse sand and gravel (fill material), underlain by fine silty sand with pebbles. The native material appeared to be either glacial outwash or fluvial sediments from the nearby Gerbode Creek. Bedrock was encountered at depths ranging from 7 - 10 feet bgs. Only in boring DP-3 were signs of petroleum contamination noted. However, field observations indicated that the odor was of gasoline, not fuel oil. Also note that the petroleum odor and PID signature was strongest near the surface and extended to a depth of 5-6 feet bgs, which is often an indicator that the source is a surface spill and not a leaking UST.

After evaluating the soil boring data, SDI made the decision to install two monitoring wells to allow sampling of the groundwater. This was done with an 8-inch diameter hollow stem auger. Well MW-1W was installed in the location where DP-1 was installed, and MW-2W was installed 3 feet north of DP-3 (refer to site map). Wells were constructed out of 2-inch (i.d.) PVC, and were screened with a factory slotted (0.02-inch) screen covered with filter sock. Borings were then backfilled with clean sand capped with bentonite, and wells were finished off with steel well boxes and cement. Well construction details can be seen in the soil boring logs. Note that while SDI was completing the well boxes with concrete, the hole in the pavement where DP-3 was installed was filled with concrete.

GROUNDWATER SAMPLING

Groundwater samples were collected from wells MW-1W and MW-2W on June 17, 1999. Prior to sampling, water levels were measured to evaluate the hydrogeology under this portion of the site. Water levels were measured again after the wells were surveyed on July 26, 1999. The survey data and water level measurements are presented in the table below.

Water Level Survey Results		Groundwater Elevation Data	
June 17, 1999		July 26, 1999	
MW-1W	87.05	79.65	79.19
MW-2W	86.25	79.70	79.37

When compared to the elevation data collected from other wells onsite on July 26, 1999, the direction and gradient of groundwater movement can be calculated.

¹ Letter from Greg Leech to Paul van Hohenbeke, ANR, August 25, 1987.

According to our measurements, groundwater flows to the north/northwest across the site at an approximate gradient of 0.008 ft/ft. The direction and gradient are typical from our previous experience monitoring the groundwater at the shopping center. Note that the flow direction is likely highly influenced by the presence of Gerbode Creek and the wetland area on the north and west portions of the site (refer to Orthophoto in Appendix 1, page 2).

After measuring water levels on June 17, 1999, the two wells were developed by purging until dry three times. Water was noted to be clear in MW-2W and silty in MW-1W. No odor or sheen was observed in either of the wells. Finally, samples were collected in Teflon bailers and preserved with acid and placed on ice for transport to the laboratory.

RESULTS

Groundwater analyses were performed by Endyne Laboratory in Williston, Vermont, using EPA Method 8021B (Purgeable Aromatics by GC/MS) and Method EPA 8015B (Diesel Range Total Petroleum Hydrocarbons). Laboratory reports are included in Appendix 2, and a summary of the water results is presented in Table 1 (Appendix 1, page 5).

The only signs of petroleum contamination were trace levels of Xylenes (1.3 ppb) in MW-1W and MW-2W, and a hit of Toluene (1.1 ppb) in MW-2W. No Total Petroleum Hydrocarbons (TPH) were detected in either sample. One potential qualitative sign of contamination is the detection of >10 unidentified peaks in both samples. However, this is not of significant concern. Of more importance is the fact that both wells are in full compliance with Vermont's Groundwater Enforcement Standards. Also, the fact that essentially no contamination was detected in the location of the former UST is a strong indication that the tank did not leak.

SUMMARY AND CONCLUSIONS

A soil boring and well installation program was instigated by H&N in the parking lot in front of the former Woolworth Garage on June 16, 1999. A day later, groundwater samples were collected for laboratory analysis. Evaluation of the field and laboratory

Mr. Chuck Schwer
July 30, 1999
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data indicates that slight signs of petroleum contamination were detected in one soil boring (DP-3) and in the two monitoring wells (MW-1W and MW-2W).

The 12,000-gallon fuel oil tank that was present in this portion of the parking lot between 1967 and 1987 contaminated the surrounding soil or groundwater. No fuel oil odor was observed in the soil during drilling and TPH-diesel was not detected in the groundwater via laboratory analysis. Rather, the evidence collected points to a minor source of gasoline that may have entered through a hole in the pavement at some point in the recent past. This estimation is based on the fact that a gasoline odor and high PID measurement were noted in the upper soil beneath this hole. Because vehicles, generators, and miscellaneous equipment are often parked in front of the garage, it is possible that leaking or spilling of gasoline may have occurred in the recent past. The potential for future contaminants entering the subsurface via this avenue was eliminated when H&N filled the subject hole with concrete while completing the two monitoring wells.

In conclusion, H&N did not find evidence of a fuel oil leak related to the former 12,000-gallon UST. The minor contamination detected beneath the parking lot does not merit source removal or continued monitoring. The two wells that are currently installed can be abandoned according to the State's guidelines, or can be used for future monitoring if the owner prefers.

Sincerely,

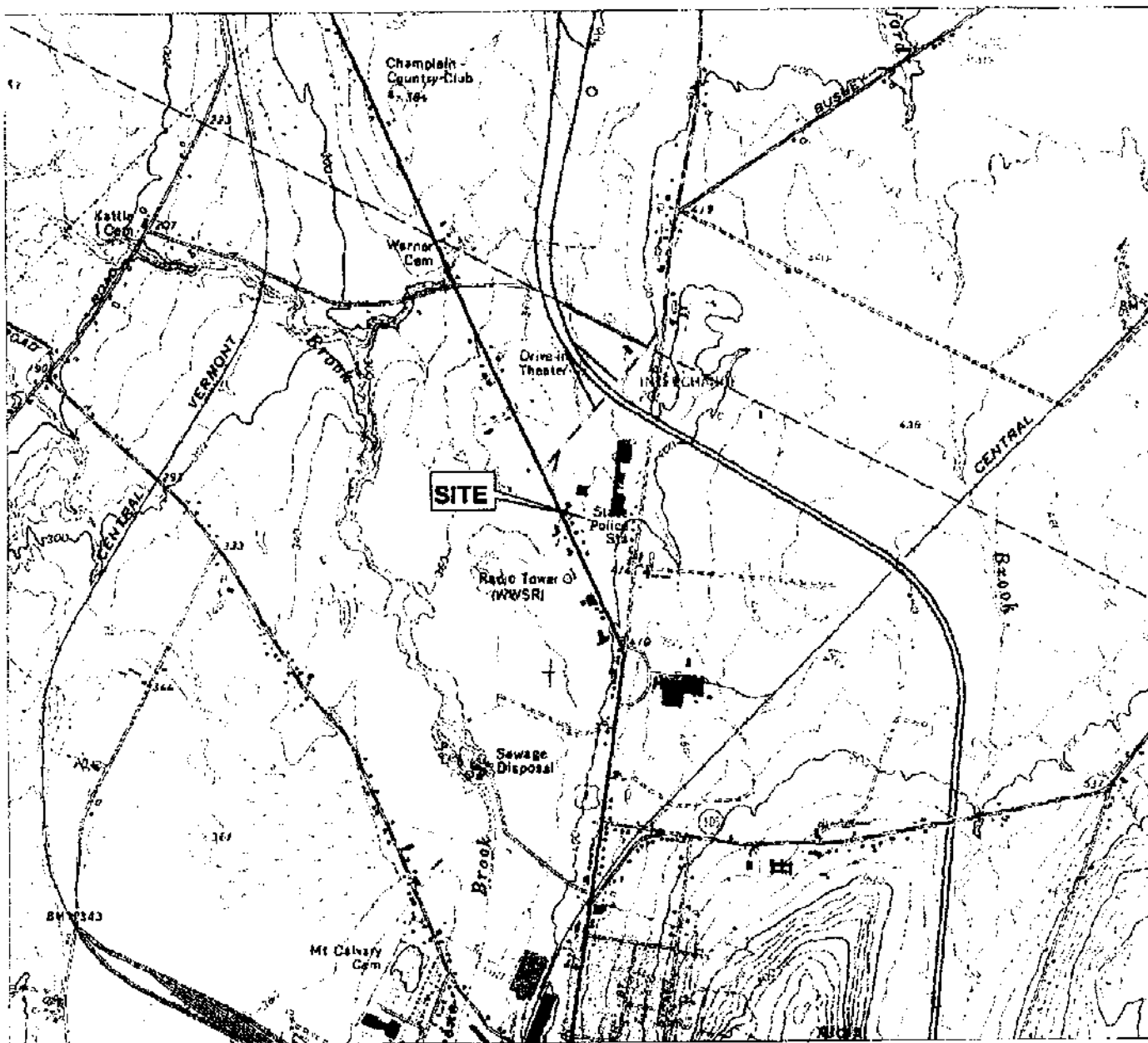
A handwritten signature in black ink, appearing to read "Miles Waite", with a stylized flourish at the end.

Miles Waite, Ph.D.
Senior Hydrogeologist

Attachment

cc: David Kleger

Commons Shopping Center St. Albans, Vermont Site Location Map



2000 0 2000 Feet



PG. 001 001 001 - 001 001 001 - 001 001 001 - 001 001 001 - 001 001 001

Commons Shopping Center
St. Albans, Vermont
1995 Orthophoto Base



400 0 400 Feet

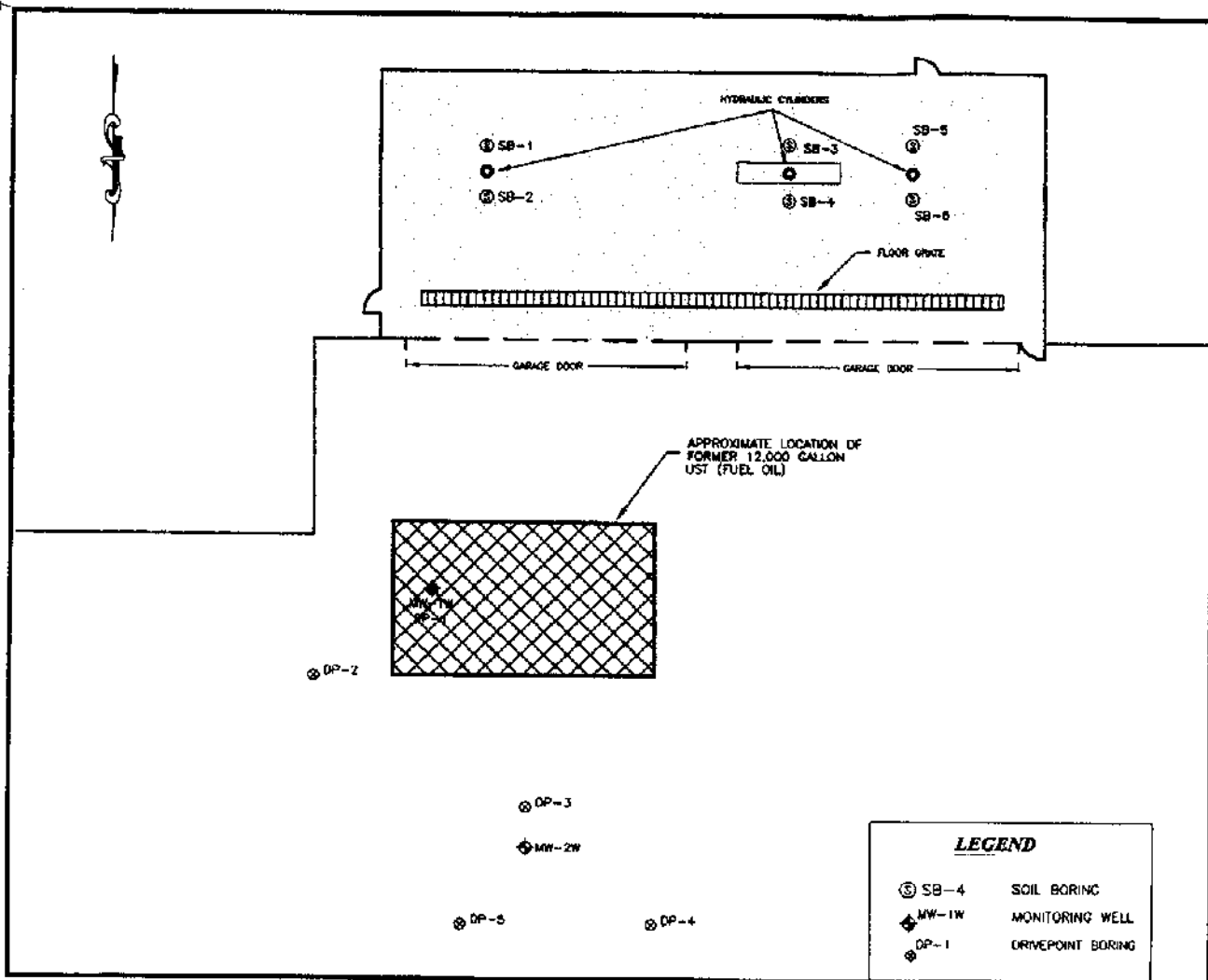


NWI Wetland Boundary



INFORMATION
SYSTEMS
SERVICES

1000 W. 10th Street, Suite 100, St. Albans, VT 05478



Heindel and Noyes Hydrogeology • Geology • Environmental Engineering • SPECIALIZED SURVEYING AND MAPPING P.O. BOX 8708 BURLINGTON, VERMONT 05408-1710 Prepared by: Information & Visualization Services		DATE: JULY 20, 1998	PROJECT NO: 98127
		PROJECT NAME: Former Woodworth Garage Hightgate Commons Shopping Center	PROJECT LOCATION: VERMONT
ST. ALBANS, VERMONT		PREPARED BY: J. Smith CHECKED BY: W. W. Noyes APPROVED BY: J. Noyes	SCALE: 1" = 10' FILE: C:\CLESERBORINGS SITE PLAN
DRAWN BY: J. Noyes CHECKED BY: J. Noyes APPROVED BY: J. Noyes		SCALE: 1" = 10' FILE: C:\CLESERBORINGS SITE PLAN	DRAWN BY: J. Noyes CHECKED BY: J. Noyes APPROVED BY: J. Noyes

TABLE 1
GROUNDWATER QUALITY RESULTS (PPB)
The Commons Shopping Center / Woolworth
St. Albans, Vermont

Well	Compound	Units	VGES	6/17/99 Method 8021B
MW-01W	Benzene	ppb	5	ND / < 1
	Toluene	ppb	1000	TBQ / < 1
	Ethylbenzene	ppb	700	ND / < 1
	Total Xylenes	ppb	10000	1.3
	Total BTEX	ppb	—	< 4.3
	1,3,5-Trimethylbenzene	ppb	4	ND / < 1
	1,2,4-Trimethylbenzene	ppb	5	TBQ / < 1
	Naphthalene	ppb	20	ND / < 1
	MTBE	ppb	40	ND / < 10
	Unidentified peaks	#	—	> 10
	TPH - DRO (EPA 8015B)	ppm	—	ND / < 0.40
MW-02W	Benzene	ppb	5	ND / < 1
	Toluene	ppb	1000	1.1
	Ethylbenzene	ppb	700	ND / < 1
	Total Xylenes	ppb	10000	1.3
	Total BTEX	ppb	—	< 4.4
	1,3,5-Trimethylbenzene	ppb	4	ND / < 1
	1,2,4-Trimethylbenzene	ppb	5	ND / < 1
	Naphthalene	ppb	20	ND / < 1
	MTBE	ppb	40	ND / < 10
	Unidentified peaks	#	—	> 10
	TPH - DRO (EPA 8015B)	ppm	—	ND / < 0.40

VGES = Vermont Groundwater Enforcement Standard
TPH-DRO = Total Petroleum Hydrocarbons - Diesel Range
ND = None detected.
TBQ = Trace Below Quantification.

• 6

NA = Not Applicable
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SOIL BORING LOG

[illegible]

NA = Not Applicable

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SOIL BORING LOG

[illegible]

NA = Not Applicable

U:\PROJECTS\KLEG_COM\SOILLOGS\1616LOG.DOC

SOIL BORING LOG

[illegible]

NA = Not Applicable

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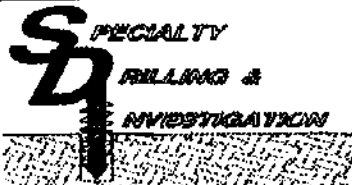
SOIL BORING LOG

[illegible]

NA = Not Applicable

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SOIL BORING LOG

				P.O. Box 64709, Burlington, Vermont 05408-4709 Tel: 802-658-0820 Fax: 802-860-1014		Project Name: Kieger Commons Project Location: Woolworth, St. Albans, Vermont Boring Number: 6 Sheet 1 of 1 SDI Project Number: 98903									
Boring Location: MW-W1 Foreman: Chris Aldrich H&N Staff: Chris Aldrich and Miles Waite				Date Started: 6/16/99 Date Completed: 6/16/99		Rig Hours Meter Start: 528.4 Time: 1:30 PM Rig Hours Meter End: 529.3 Time: 2:15 PM									
Sampling Method: Split Spoon Size: 8" Hammer: 140 pound Fall: 30 inches						Direct Push Size: _____				Other Type: _____					
						Groundwater Readings Date _____ Depth _____ Casing _____ Stabil. _____ Time _____									
Sample				Sample Description		Strata Change & General Description		Field Testing PID		Equipment or Well Installed					
No.	Recovery	Depth	Blows												
				Refer to log for DP-1 (well installed in DP-1 location with 8" auger)						TD: 10'					
				From cuttings, water table appears to be at 4'						Screen: 10' - 2'					
										Sand: 10' - 1.5'					
				Set 2" diameter well at 10'						Bentonite: 1.5' - 1'					
										Cement: 1' - 0					
Proportions Used Trace: 0 to 10% Little: 10 to 20% Some: 20 to 35% And: 35 to 50%				Penetration Resistance 140 lb. wt falling 30" on 2" O.D. Sampler Cohesive Density 0-4 Very Loose 5-9 Loose 10-29 Med. Dense 30-49 Dense 50+ Very Dense				Cohesive Consistency 0-2 Very Soft 3-4 Soft 5-8 M/Stiff 9-15 Stiff 16-30 Very Stiff 31+ Hard				Well Construction Details 2" PVC Screen (.020): 10' 2" PVC Riser: 2.5' Plug/Cap: 1 Filter Sock: 9' Sand: 5 bags Concrete: 1/2 bag Bentonite chips: 1/3 bag Well Guard: 1 flushmount			

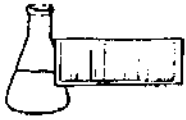
SOIL BORING LOG

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NA = Not Applicable

TD = TOTAL DEPTH

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ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05496
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

CLIENT: Heindel & Noyes
PROJECT: Kleeger/Woolworth
REPORT DATE: June 28, 1999

ORDER ID: 2756
DATE RECEIVED: June 17, 1999

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Different groups of analyses may be reported under separate cover.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

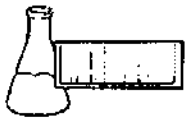
Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits, unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

CLIENT: Heindel & Noyes
PROJECT: Kleegeer/Woolworth
REPORT DATE: June 28, 1999

ORDER ID: 2756
DATE RECEIVED: June 17, 1999
SAMPLER: MW
ANALYST: 820

Ref. Number: 139977

Site: MW-1W

Date Sampled: June 17, 1999

Time: 2:45 PM

Parameter

Result

Unit

Method

Analysis Date

TPH 8015 DRO

< 0.40

mg/L

SW 8015B

6/25/99

Ref. Number: 139978

Site: MW-2W

Date Sampled: June 17, 1999

Time: 2:55 PM

Parameter

Result

Unit

Method

Analysis Date

TPH 8015 DRO

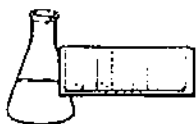
< 0.40

mg/L

SW 8015B

6/25/99

1	pH	6	TGN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 1010/01020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 1080 Part/PCB
4	Nitrate N	9	BOD ₅	14	Turbidity	19	BTEX	24	EPA 508 Part/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Heindel & Noyes
PROJECT NAME: Kleeger/Woolworth
REPORT DATE: June 29, 1999
DATE SAMPLED: June 17, 1999

ORDER ID: 2756
REF.#: 139,977 - 139,978

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

EPA METHOD 8021B--PURGEABLE AROMATICS

CLIENT: Heindel & Noyes

DATE RECEIVED: June 17, 1999

PROJECT NAME: Kleegeer/Woolworth

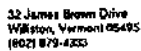
REPORT DATE: June 29, 1999

CLIENT PROJ. #: NI

ORDER ID: 2756

Ref. #:	139,977	139,978			
Site:	MW-1W	MW-2W			
Date Sampled:	6/17/99	6/17/99			
Time Sampled:	2:45	2:55			
Sampler:	M.W.	M.W.			
Date Analyzed:	6/28/99	6/28/99			
UIP Count:	>10	>10			
Dil. Factor (%):	100	100			
Surr % Rec. (%):	95	94			
Parameter	Conc. (ug/L)	Conc. (ug/L)			
MTBE	<10	<10			
Benzene	<1	<1			
Toluene	TBQ <1	1.1			
Ethylbenzene	<1	<1			
Xylenes	1.3	1.3			
1,3,5 Trimethyl Benzene	<1	<1			
1,2,4 Trimethyl Benzene	TBQ <1	<1			
Naphthalene	<1	<1			

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated



2079

31683

Project Name: Klerger/Woolwirths	Reporting Address: 14 JN	Billing Address: 14 JN
Site Location: St. Albans, VT		
Endyne Project Number: 2756	Company: H & N Contact Name/Phone #: Miles White / 658 020	Sampler Name: Miles White Phone #:

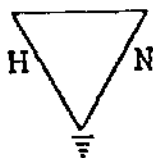
[illegible]

Relinquished by: Signature <i>M. L. E. W. O. R. S.</i>	Received by: Signature <i>ALLISON HARRIS</i>	Date/Time <i>5/17/99 4:25</i>
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ☐ No ☐

Requested Analyses

[illegible]



Heindel and Noyes

P.O. Box 64709 Burlington, Vermont 05406-4709

• Consulting Hydrogeologists
• Engineers
• Environmental Scientists

802-658-0820

Fax 802-860-1014

FILE COPY

April 29, 1999

APR 30 1999

MAILED / FAXED / HD

Mr. David Kleger
Commons Associates
c/o Kellogg Properties
40 W. 57th Street
New York, NY 10019

Re: Woolworth Investigation
Commons Shopping Center
St. Albans, VT

Dear David:

This letter summarizes the results of a subsurface investigation performed by Heindel & Noyes (H&N) on April 8, 1999, at the site of the former Woolworth's garage at the Highgate Commons Mall in St. Albans. Accordingly, the letter documents field observations of the site condition, presents laboratory analytical results, and gives conclusions and recommendations as to the future action at the site.

SITE DESCRIPTION AND BACKGROUND

The former Woolworth garage is located at the northern end of the Highgate Commons Mall in St. Albans, Vermont. The garage is made up of two bays, with an approximate area of 1060 ft². The floor and surrounding walls are constructed of concrete. Refer to the attached site plan to view the layout of the garage.

Presently, the garage is used by a local contractor for light truck maintenance and as a storage facility. Historically, the garage operated as Grant Automotive until it closed in 1987. Records show that a 12,000-gallon underground storage tank (fuel oil) was removed from the parking lot outside the garage in 1987. No records indicate that the hydraulic cylinders used for the car hoists, which are buried underneath the garage and utilize hydraulic oil, were ever removed. A total of three cylinders are located in the floor of the garage (refer to site plan for locations). Due to the possible threat of hydraulic oil leakage, H&N undertook an investigation to test the soils adjacent to the cylinders and the groundwater beneath the cylinders. The following section describes the details of this investigation.

SOIL BORING INSTALLATION

On April 8, 1998, a team from Specialty Drilling & Investigation (SDI) installed a total of six soil borings in the interior of the garage. Two borings were installed adjacent to

each of the three hydraulic cylinders. This was accomplished by using a jackhammer to core through the concrete, and then using a hydraulically operated drive point to bore through the soil and collect samples. The drill rig operated by SDI supplied all of the hydraulics used for this work. The locations of the borings, labeled SB-1 through SB-6, can be seen on the attached site plan. The depths of each boring, in feet below ground surface (BGS), are presented in Table 1.

Soil samples were collected at approximate 2-foot intervals to properly classify the soil stratigraphy underneath the site. Observations were made as to the soil type, texture, moisture content, visual and olfactory signs of contamination, and were then screened for volatile components using a photo-ionization detector (PID). Refer to the attached boring logs for the full description of each sample that was collected. After screening, three of the samples, one from each hydraulic cylinder, were collected in 40-ml vials and preserved on ice for future laboratory analysis. The depth intervals of these three samples, SB-2, SB-4 and SB-6, are also shown in Table 1.

Table 1: Soil Boring/Monitoring Well Details

Soil Boring	Total Depth (ft)	Soil Sample Depth Interval (ft)	Screened Interval (ft)	Water Level (ft)
SB-1	4.7	NA	NA	NA
SB-2	5.4	4.7 - 5.4	2.4 - 5.4	DRY
SB-3	6.5	NA	3.5 - 6.5	DRY
SB-4	4.5	2.5 - 4.5	NA	NA
SB-5	6.5	NA	3.5 - 6.5	DRY
SB-6	6.8	4.8 - 6.8	NA	NA

Due to the dense consistency of the native till, soil borings could not be advanced deeper than 6.8 feet below ground surface. Although no obvious signs of saturation were noted, we decided to install three temporary monitoring wells in an attempt to collect groundwater samples. Borings SB-2, SB-3 and SB-5 were fitted with 3/4-inch diameter wells, each with a 3-foot slotted screened section. Refer to Table 1 for the screened interval of each well. Note that the three borings that were not fitted with monitoring wells were subsequently filled with bentonite and native material, and then capped with concrete. At the conclusion of this investigation, the three temporary wells will be removed and the borings will be filled as well.

RESULTS

In general, the soil stratigraphy is composed of a layer of loose, sandy fill, likely emplaced during the building construction, underlain by a dense, sandy-pebbly till. The till, which varied in color from brown to olive green, was likely native material. The moisture content increased with depth, with moist-wet soils observed at depths greater than 4.5 feet below ground surface. No fully saturated soils were noted. Also, results of the PID screening indicated that no obvious signs of contamination were present in any of the soils that were encountered.

At the end of the investigation on April 8, no groundwater had accumulated in any of the three temporary wells. In low permeability media, such as the dense till encountered in these six borings, the groundwater often flows very slowly. With this in mind, H&N staff went back to the site on April 9 with a small vacuum pump to try to induce groundwater flow into the wells. Even after a full day of applied vacuum, no groundwater was observed in any of the wells.

Although no conclusions could be made regarding the water quality underneath the garage, the soil sample analytical results allow us to make a confident evaluation of the soil quality adjacent to the three hydraulic cylinders. All analyses were performed by Endyne Laboratory in Williston, Vermont using EPA Method 8260 (Volatile Organics by GC/MS) and EPA Method EPA 8015b (Diesel Range Total Petroleum Hydrocarbons). Laboratory reports are attached, and a summary table of the soil results are displayed in Table 2 below.

Table 2: Soil Sample Laboratory Results, April 8, 1999 (EPA 8260 & EPA 8015b).

Parameter	Units	SB-2	SB-4	SB-6
Benzene	ppb	ND < 10	ND < 10	ND < 10
Toluene	ppb	ND < 10	ND < 10	ND < 10
Ethylbenzene	ppb	ND < 10	ND < 10	ND < 10
Xylenes	ppb	ND < 20	ND < 20	ND < 20
Total BTEX	ppb	ND < 50	ND < 50	ND < 50
MTBE	ppb	ND < 20	ND < 20	ND < 20
Tetrachloroethene	ppb	ND < 10	ND < 10	ND < 10
Trichloroethene	ppb	ND < 10	ND < 10	ND < 10
Unidentified Peaks	#	0	0	0
Total Petroleum Hydrocarbons	ppm	249	ND < 5	ND < 5
Diesel Range Organics				

No volatile organic compounds were detected in any of the three soil samples: The only sample to show any sign of contamination was SB-2, in which Total Petroleum Hydrocarbons (TPH) were detected at 249 mg/Kg (ppm). This is an indication that the soil around the eastern-most hydraulic cylinder has been in contact with some type of petroleum-based compound. To classify the type of petroleum in question, we requested a chemist at Endyne to analyze the chromatogram from the SB-2 analysis. Based on the volatility of the hydrocarbons, the fuel I.D. appears to be hydraulic/motor oil. Note that the high ionization potential of this type of hydrocarbon, relative to a fuel like gasoline or diesel fuel, explains why the presence of contamination in SB-2 was not detected with the PID in the field.

CONCLUSIONS

According to the Agency of Natural Resources' Guidelines for Petroleum Contaminated Soils and Debris, the level of contamination detected in sample SB-2 does not merit soil excavation or treatment. Furthermore, if the soil was removed and TPH was not

Mr. David Kleger
April 29, 1999
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detected above 1,000 ppm, the soil could be thin spread as a method of disposal. From an environmental perspective, the findings of this investigation are relatively insignificant and benign, and do not require any remedial action. However, from a real estate perspective, it does make sense to take a proactive approach and simply remove the cylinders as a potential threat. For this reason, H&N recommends that the three cylinders be properly closed down. This will entail draining any remaining hydraulic oil from the concrete wells beneath each cylinder and removing them from the ground. If removal is not feasible, then draining the oil is the bare minimum that should be done.

With the presence of TPH confirmed beneath the garage, there is also a valid argument that more site investigation is needed to fully characterize the extent of contamination at this portion of the property. This argument is compounded by the fact that a heavy oil odor and PID measurements in excess of 300 ppm were noted by an H&N field technician in a shallow soil boring outside the garage on August 31, 1998. This boring was above the location of the former 12,000 gallon fuel oil tank, approximately 50 feet north of SB-2. Although this finding was never reported to the State, we feel obligated to do so. Again, this is another situation that calls for a proactive approach, and it does make sense to nail down any unanswered questions about what may be lurking beneath the pavement outside the garage. As a first step, we would like to be informed of the work performed by the previous consultants at this portion of your property. It is also sensible to do some research to determine whether this site is applicable to the State of Vermont's Petroleum Cleanup Fund (PCF). If so, any expenditures related to a leaking underground storage tank in excess of \$10,000, which include all contractors and consultants fees, are covered by the State.

Finally, as the project manager for this site, I just wanted to inform you that the remedial system for the cleanup of the area behind the One Stop Laundromat/Pie in the Sky is close to being operational. I will keep you updated and will be sure to send you report that details the design, installation and startup of the system.

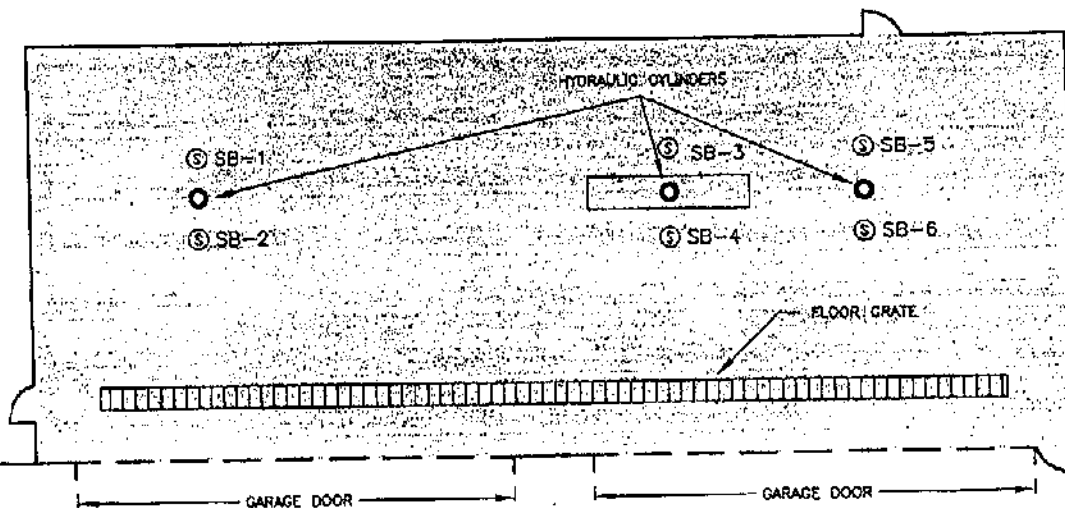
Please feel free to call Jeff Noyes or me to further discuss these issues. Note that the results of this investigation, as well as the presence of contamination in the parking lot outside the garage noted last year, have not been reported to the State of Vermont. We will wait until we can talk to you before we proceed any further with this matter.

Sincerely,



Miles Waite, Ph.D.
Senior Hydrogeologist

Attachment



LEGEND

⑤ SB-4 SOIL BORING

Heindel and Noyes

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• Environmental Engineering •
• Environmental Investigations and Remediation

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PROJECT NO. 96127
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HIGHGATE COMMONS SHOPPING CENTER
VERMONT

SITE PLAN

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SC 115- 1407